Implementing ADS-B in the U.S.

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Why Do We Want ADS-B in the U.S.?

- Government
  - Increased capacity & efficiency while improving safety
  - High quality, uniform surveillance, including non-radar airspace
  - Improved support of ATC automation tools
- Users - General Aviation
  - Increased safety through improved situational awareness
  - Access to beneficial services (FIS-B, Non-radar ATC)
- Users - Commercial
  - Increased efficiency & capacity through beneficial applications
    - Terminal area (beginning in near-term)
    - En route (mid - long term)

ADS-B Applications in the U.S.

From the FAA's Operational Evolution Plan (OEP) and RTCA's Roadmap for Free Flight Enhancements -

- Near to Mid Term:
  - Enhance See and Avoid
  - FAA OEP solutions (in pockets):
    - Coordinate for Efficient Surface Movement
    - Enhance Surface Situational Awareness
    - Maintain Runway Use in Reduced Visibility
    - Space Closer to Visual Standards
- Far Term (NAS-wide):
  - Improve Terminal Operations in Low Visibility
  - Enhance En Route Air-to-Air Operations
  - Provide ADS-B Surveillance in Non-Radar Airspace
  - Establish ADS-B Separation Standards

ADS-B: Two Implementation Phases

2000 2001 2002 2003 2004 2005 2006

PHASE 1

ADS-B Air-Air Nationally and Local "Pockets" of Air-Ground Implementation

- Develop and validate ADS-B concepts (SF21)
- Make ADS-B link decision
- Initial air-ground "pockets" in Ohio Valley, Capstone (YK Delta, SE Alaska), and at ASDE airports
- Users develop business cases for ADS-B and begin voluntary equipage

Achieve Initial Highly Beneficial Capabilities EARLY ⇒ ***Stimulate User Equipage***

Link Decision

National Deployment Investment Decision

National Deployment

2004 2005 2006 2007 2008 2009 2010+

PHASE 2

National Deployment of Ground Infrastructure

- Develop and deploy ADS-B ground infrastructure to provide
  - ADS-B surveillance to ATC
  - Uplink of TIS-B and FIS-B
- Continue development, validation, and implementation of ADS-B applications (terminal and en route)

Accomplishments to Date

- Safe Flight 21 Evaluations
  - Ohio River Valley testbed (Memphis, Louisville)
- Capstone
  - Radar-like services (Bethel, AK region)
- Analyses and Tests
  - Preliminary Costs and Benefits
  - TLAT (with Eurocontrol)
  - Safety assessment
  - Vulnerability assessment
  - Flight Tests (LA, FAATC, Frankfurt)

What Data Do We Have?

- **Technical/Transitional**
  - **TLAT report (FAA/Eurocontrol)**
  - **Operational Safety Assessment**
  - **Additional Data:**
    - **Follow-on Link Simulation Results (1090 ES, UAT, VDL Mode 4)**
    - **Additional Flight Test Results (1090 ES)**
    - **Additional Lab Test Data (1090 ES, UAT)**
    - **Assessment of Application Supportability by Link**
    - **Assessment of Architectural Transition Paths**
    - **Results of Vendor Surveys**
    - **Initial Vulnerability Assessment**
- **Financial**
  - **Pre-Investment Cost Benefit Analysis**
  - **Additional Data:**
    - **Vendor Cost Surveys**
    - **Eurocontrol Cost/Benefit Data**
    - **DoD Cost Study**
    - **Reassessment of User Equipage/Priorities**

What Does an ADS-B Link Decision Mean?

- Decision reaffirms FAA's plan to implement ADS-B (air-air, air-ground) throughout the NAS
- Decision commits the FAA to work with the user community to develop and implement ADS-B enabled applications
- Decision reaffirms FAA's support to develop, as necessary, MOPS, ACs, TSOs, standards, pilot & controller procedures
- Decision identifies the technology to be implemented in the ground infrastructure
- Decision focuses vendor's development efforts for ADS-B avionics

Next Steps

- Continue Safe Flight 21 concept validation, Capstone activities
- Complete formal coordination within FAA, U.S. aviation community, and Eurocontrol
- **LINK DECISION ANNOUNCEMENT IN MID-2002**